SEVENTH APPROXIMATION
DATA FORM FOR CONVENTIONAL ASSESSMENT UNITS (NOGA, Version 4, 4-10-01)

IDENTIFICATION INFORMATION

Assessment Geologist:……..	D. K. Higley	Date:	4/10/2001
Region:………………………..	North America	Number:	5
Province:………………………	Denver Basin	Number:	5039
Total Petroleum System:……	Lower Cretaceous	Number:	503904
Assessment Unit:…………..	Dakota Group and D Sandstone	Number:	50390401
Based on Data as of:……….	PI WHCS and NRG Associates 1998		
Notes from Assessor……….	U.S. Lower 48 (e2) growth function		

CHARACTERISTICS OF ASSESSMENT UNIT

Oil (<20,000 cfg/bo overall) **or** Gas (≥20,000 cfg/bo overall):…   Oil

What is the minimum accumulation size?……….   0.5   mmboe grown
(the smallest accumulation that has potential to be added to reserves in the next 30 years)

No. of discovered accumulations exceeding minimum size:……..   Oil: 300   Gas: 30
Established (>13 accums.)   X   Frontier (1-13 accums.)   Hypothetical (no accums.)

Median size (grown) of discovered oil accumulation (mmbo):
                                        1st 3rd   2.2   2nd 3rd   1.4   3rd 3rd   1.2
Median size (grown) of discovered gas accumulations (bcfg):
                                        1st 3rd   8.1   2nd 3rd   7.8   3rd 3rd   8.2

Assessment-Unit Probabilities:

Attribute	Probability of occurrence (0-1.0)
1. **CHARGE:** Adequate petroleum charge for an undiscovered accum. ≥ minimum size…………….	1.0
2. **ROCKS:** Adequate reservoirs, traps, and seals for an undiscovered accum. ≥ minimum size……	1.0
3. **TIMING OF GEOLOGIC EVENTS:** Favorable timing for an undiscovered accum. ≥ minimum size	1.0

Assessment-Unit GEOLOGIC Probability (Product of 1, 2, and 3):……..………...……   1.0

4. **ACCESSIBILITY:** Adequate location to allow exploration for an undiscovered accumulation
   ≥ minimum size…………………………………………………..……………….…….…..………   1.0

UNDISCOVERED ACCUMULATIONS

No. of Undiscovered Accumulations: How many undiscovered accums. exist that are ≥ minimum size?:
(uncertainty of fixed but unknown values)

Oil Accumulations:…………………min. no. (>0)	5	median no.	25	max no.	60
Gas Accumulations:…………………min. no. (>0)	1	median no.	4	max no.	10

Size of Undiscovered Accumulations: What are the anticipated sizes (**grown**) of the above accums.?:
(variations in the sizes of undiscovered accumulations)

Oil in Oil Accumulations (mmbo):….....…min. size	0.5	median size	0.9	max. size	20
Gas in Gas Accumulations (bcfg):….....…min. size	3	median size	6	max. size	40

AVERAGE RATIOS FOR UNDISCOVERED ACCUMS., TO ASSESS COPRODUCTS
(uncertainty of fixed but unknown values)

Oil Accumulations:	minimum	median	maximum
Gas/oil ratio (cfg/bo)……………………..………	200	400	600
NGL/gas ratio (bngl/mmcfg)………………..….…	40	80	120

Gas Accumulations:	minimum	median	maximum
Liquids/gas ratio (bngl/mmcfg)………………..……..	33	66	99
Oil/gas ratio (bo/mmcfg)………………………….			

SELECTED ANCILLARY DATA FOR UNDISCOVERED ACCUMULATIONS
(variations in the properties of undiscovered accumulations)

Oil Accumulations:	minimum	median	maximum
API gravity (degrees)……………………………..	20	35	50
Sulfur content of oil (%)……………………..…..	0.1	0.2	0.4
Drilling Depth (m) …………….…..……………..	1000	1500	3000
Depth (m) of water (if applicable)…………..……			

Gas Accumulations:	minimum	median	maximum
Inert gas content (%)………………….....………	0	4	8
CO_2 content (%)……………………………...….	0	0.9	1.8
Hydrogen-sulfide content (%)……………..…….	0	0.1	1
Drilling Depth (m)………………….……………	1000	2000	3000
Depth (m) of water (if applicable)…………..…….			

Assessment Unit (name, no.)
Dakota Group and D Sandstone, 50390401

ALLOCATIONS OF POTENTIAL ADDITIONS TO RESERVES TO LAND ENTITIES
Surface Allocations (uncertainty of a fixed value)

1. Federal Lands _____ represents __8.8__ areal % of the total assessment unit

Oil in Oil Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):……….….….			
Volume % in parcel (areal % x richness factor):…		3	
Portion of volume % that is offshore (0-100%)……		0	

Gas in Gas Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):……….….….			
Volume % in parcel (areal % x richness factor):…		4	
Portion of volume % that is offshore (0-100%)……		0	

2. Private Lands _____ represents _____ areal % of the total assessment unit

Oil in Oil Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):……….….….			
Volume % in parcel (areal % x richness factor):…			
Portion of volume % that is offshore (0-100%)……			

Gas in Gas Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):……….….….			
Volume % in parcel (areal % x richness factor):…			
Portion of volume % that is offshore (0-100%)……			

3. Tribal Lands _____ represents __3.5__ areal % of the total assessment unit

Oil in Oil Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):……….….….			
Volume % in parcel (areal % x richness factor):…		0.5	
Portion of volume % that is offshore (0-100%)……		0	

Gas in Gas Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):……….….….			
Volume % in parcel (areal % x richness factor):…		0	
Portion of volume % that is offshore (0-100%)……		0	

4. CO State Lands _____ represents _____ areal % of the total assessment unit

Oil in Oil Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):……….….….			
Volume % in parcel (areal % x richness factor):…			
Portion of volume % that is offshore (0-100%)……			

Gas in Gas Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):……….….….			
Volume % in parcel (areal % x richness factor):…			
Portion of volume % that is offshore (0-100%)……			

Assessment Unit (name, no.)
Dakota Group and D Sandstone, 50390401

5. NE State Lands _____ represents _____ areal % of the total assessment unit

Oil in Oil Accumulations: minimum   median   maximum
  Richness factor (unitless multiplier):……….……..   _____   _____   _____
  Volume % in parcel (areal % x richness factor):…   _____   _____   _____
  Portion of volume % that is offshore (0-100%)……   _____   _____   _____

Gas in Gas Accumulations: minimum   median   maximum
  Richness factor (unitless multiplier):……….……..   _____   _____   _____
  Volume % in parcel (areal % x richness factor):…   _____   _____   _____
  Portion of volume % that is offshore (0-100%)……   _____   _____   _____

6. SD State Lands _____ represents _____ areal % of the total assessment unit

Oil in Oil Accumulations: minimum   median   maximum
  Richness factor (unitless multiplier):……….……..   _____   _____   _____
  Volume % in parcel (areal % x richness factor):…   _____   _____   _____
  Portion of volume % that is offshore (0-100%)……   _____   _____   _____

Gas in Gas Accumulations: minimum   median   maximum
  Richness factor (unitless multiplier):……….……..   _____   _____   _____
  Volume % in parcel (areal % x richness factor):…   _____   _____   _____
  Portion of volume % that is offshore (0-100%)……   _____   _____   _____

7. WY State Lands _____ represents _____ areal % of the total assessment unit

Oil in Oil Accumulations: minimum   median   maximum
  Richness factor (unitless multiplier):……….……..   _____   _____   _____
  Volume % in parcel (areal % x richness factor):…   _____   _____   _____
  Portion of volume % that is offshore (0-100%)……   _____   _____   _____

Gas in Gas Accumulations: minimum   median   maximum
  Richness factor (unitless multiplier):……….……..   _____   _____   _____
  Volume % in parcel (areal % x richness factor):…   _____   _____   _____
  Portion of volume % that is offshore (0-100%)……   _____   _____   _____

8. Colorado Total _____ represents _50.8_ areal % of the total assessment unit

Oil in Oil Accumulations: minimum   median   maximum
  Richness factor (unitless multiplier):……….……..   _____   _____   _____
  Volume % in parcel (areal % x richness factor):…   _____   __58__   _____
  Portion of volume % that is offshore (0-100%)……   _____   __0__   _____

Gas in Gas Accumulations: minimum   median   maximum
  Richness factor (unitless multiplier):……….……..   _____   _____   _____
  Volume % in parcel (areal % x richness factor):…   _____   __90__   _____
  Portion of volume % that is offshore (0-100%)……   _____   __0__   _____

9. Nebraska Total _____ represents ___26.6___ areal % of the total assessment unit

Oil in Oil Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):………..….			
Volume % in parcel (areal % x richness factor):…		20	
Portion of volume % that is offshore (0-100%)……		0	

Gas in Gas Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):………..….			
Volume % in parcel (areal % x richness factor):…		4	
Portion of volume % that is offshore (0-100%)……		0	

10. South Dakota Total _____ represents ___10.1___ areal % of the total assessment unit

Oil in Oil Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):………..….			
Volume % in parcel (areal % x richness factor):…		2	
Portion of volume % that is offshore (0-100%)……		0	

Gas in Gas Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):………..….			
Volume % in parcel (areal % x richness factor):…		0	
Portion of volume % that is offshore (0-100%)……		0	

11. Wyoming Total _____ represents ___12.5___ areal % of the total assessment unit

Oil in Oil Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):………..….			
Volume % in parcel (areal % x richness factor):…		20	
Portion of volume % that is offshore (0-100%)……		0	

Gas in Gas Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):………..….			
Volume % in parcel (areal % x richness factor):…		6	
Portion of volume % that is offshore (0-100%)……		0	

12. Other (Private and State) _____ represents ___87.7___ areal % of the total assessment unit

Oil in Oil Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):………..….			
Volume % in parcel (areal % x richness factor):…		96.5	
Portion of volume % that is offshore (0-100%)……		0	

Gas in Gas Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):………..….			
Volume % in parcel (areal % x richness factor):…		96	
Portion of volume % that is offshore (0-100%)……		0	

13. USFS _____ represents ___7___ areal % of the total assessment unit

Oil in Oil Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):………….……			
Volume % in parcel (areal % x richness factor):…		2.4	
Portion of volume % that is offshore (0-100%)……		0	

Gas in Gas Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):………….……			
Volume % in parcel (areal % x richness factor):…		3.2	
Portion of volume % that is offshore (0-100%)……		0	

14. Other Federal Lands _____ represents ___1.8___ areal % of the total assessment unit

Oil in Oil Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):………….……			
Volume % in parcel (areal % x richness factor):…		0.6	
Portion of volume % that is offshore (0-100%)……		0	

Gas in Gas Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):………….……			
Volume % in parcel (areal % x richness factor):…		0.8	
Portion of volume % that is offshore (0-100%)……		0	

ALLOCATIONS OF POTENTIAL ADDITIONS TO RESERVES TO ECOSYSTEMS
Surface Allocations (uncertainty of a fixed value)

1. Arkansas Tablelands (ARTL) _____ represents __18.93__ areal % of the total assessment unit

Oil in Oil Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):…………..…			
Volume % in parcel (areal % x richness factor):…		3	
Portion of volume % that is offshore (0-100%)……		0	

Gas in Gas Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):…………..…			
Volume % in parcel (areal % x richness factor):…		3	
Portion of volume % that is offshore (0-100%)……		0	

2. Black Hills (BLKH) _____ represents __2.07__ areal % of the total assessment unit

Oil in Oil Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):…………..…			
Volume % in parcel (areal % x richness factor):…		0.5	
Portion of volume % that is offshore (0-100%)……		0	

Gas in Gas Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):…………..…			
Volume % in parcel (areal % x richness factor):…		0.5	
Portion of volume % that is offshore (0-100%)……		0	

3. Central High Plains (CNHP) _____ represents __35.02__ areal % of the total assessment unit

Oil in Oil Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):…………..…			
Volume % in parcel (areal % x richness factor):…		84	
Portion of volume % that is offshore (0-100%)……		0	

Gas in Gas Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):…………..…			
Volume % in parcel (areal % x richness factor):…		84	
Portion of volume % that is offshore (0-100%)……		0	

4. Central High Tablelands (CNHT) _____ represents __12.76__ areal % of the total assessment unit

Oil in Oil Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):…………..…			
Volume % in parcel (areal % x richness factor):…		7.5	
Portion of volume % that is offshore (0-100%)……		0	

Gas in Gas Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):…………..…			
Volume % in parcel (areal % x richness factor):…		7.5	
Portion of volume % that is offshore (0-100%)……		0	

5.   Nebraska Sand Hills (NBSH)   represents   3.17   areal % of the total assessment unit

Oil in Oil Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):……….……			
Volume % in parcel (areal % x richness factor):…		2	
Portion of volume % that is offshore (0-100%)……		0	

Gas in Gas Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):……….……			
Volume % in parcel (areal % x richness factor):…		2	
Portion of volume % that is offshore (0-100%)……		0	

6.   Northern Parks and Ranges (NPRN)   represents   3.42   areal % of the total assessment unit

Oil in Oil Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):……….……			
Volume % in parcel (areal % x richness factor):…		1	
Portion of volume % that is offshore (0-100%)……		0	

Gas in Gas Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):……….……			
Volume % in parcel (areal % x richness factor):…		1	
Portion of volume % that is offshore (0-100%)……		0	

7.   Northwestern Great Plains (NWGP)   represents   24.28   areal % of the total assessment unit

Oil in Oil Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):……….……			
Volume % in parcel (areal % x richness factor):…		2	
Portion of volume % that is offshore (0-100%)……		0	

Gas in Gas Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):……….……			
Volume % in parcel (areal % x richness factor):…		2	
Portion of volume % that is offshore (0-100%)……		0	

8.   Southern Parks and Ranges (SPRA)   represents   0.35   areal % of the total assessment unit

Oil in Oil Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):……….……			
Volume % in parcel (areal % x richness factor):…		0	
Portion of volume % that is offshore (0-100%)……		0	

Gas in Gas Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):……….……			
Volume % in parcel (areal % x richness factor):…		0	
Portion of volume % that is offshore (0-100%)……		0	

9. _____ represents _____ areal % of the total assessment unit

Oil in Oil Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):……………..…	_____	_____	_____
Volume % in parcel (areal % x richness factor):…	_____	_____	_____
Portion of volume % that is offshore (0-100%)……	_____	_____	_____

Gas in Gas Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):……………..…	_____	_____	_____
Volume % in parcel (areal % x richness factor):…	_____	_____	_____
Portion of volume % that is offshore (0-100%)……	_____	_____	_____

10. _____ represents _____ areal % of the total assessment unit

Oil in Oil Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):……………..…	_____	_____	_____
Volume % in parcel (areal % x richness factor):…	_____	_____	_____
Portion of volume % that is offshore (0-100%)……	_____	_____	_____

Gas in Gas Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):……………..…	_____	_____	_____
Volume % in parcel (areal % x richness factor):…	_____	_____	_____
Portion of volume % that is offshore (0-100%)……	_____	_____	_____

11. _____ represents _____ areal % of the total assessment unit

Oil in Oil Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):……………..…	_____	_____	_____
Volume % in parcel (areal % x richness factor):…	_____	_____	_____
Portion of volume % that is offshore (0-100%)……	_____	_____	_____

Gas in Gas Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):……………..…	_____	_____	_____
Volume % in parcel (areal % x richness factor):…	_____	_____	_____
Portion of volume % that is offshore (0-100%)……	_____	_____	_____

12. _____ represents _____ areal % of the total assessment unit

Oil in Oil Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):……………..…	_____	_____	_____
Volume % in parcel (areal % x richness factor):…	_____	_____	_____
Portion of volume % that is offshore (0-100%)……	_____	_____	_____

Gas in Gas Accumulations:	minimum	median	maximum
Richness factor (unitless multiplier):……………..…	_____	_____	_____
Volume % in parcel (areal % x richness factor):…	_____	_____	_____
Portion of volume % that is offshore (0-100%)……	_____	_____	_____

ALLOCATIONS OF POTENTIAL ADDITIONS TO RESERVES TO LAND ENTITIES
Subsurface Allocations (uncertainty of a fixed value)

Based on Data as of: Data not available

1.   All Federal Subsurface   represents   areal % of the total assessment unit

Oil in Oil Accumulations: minimum   median   maximum
  Richness factor (unitless multiplier):………….….   _____   _____   _____
  Volume % in parcel (areal % x richness factor):…   _____   _____   _____
  Portion of volume % that is offshore (0-100%)……   _____   _____   _____

Gas in Gas Accumulations: minimum   median   maximum
  Richness factor (unitless multiplier):………….….   _____   _____   _____
  Volume % in parcel (areal % x richness factor):…   _____   _____   _____
  Portion of volume % that is offshore (0-100%)……   _____   _____   _____

2.   Other Subsurface   represents   areal % of the total assessment unit

Oil in Oil Accumulations: minimum   median   maximum
  Richness factor (unitless multiplier):………….….   _____   _____   _____
  Volume % in parcel (areal % x richness factor):…   _____   _____   _____
  Portion of volume % that is offshore (0-100%)……   _____   _____   _____

Gas in Gas Accumulations: minimum   median   maximum
  Richness factor (unitless multiplier):………….….   _____   _____   _____
  Volume % in parcel (areal % x richness factor):…   _____   _____   _____
  Portion of volume % that is offshore (0-100%)……   _____   _____   _____